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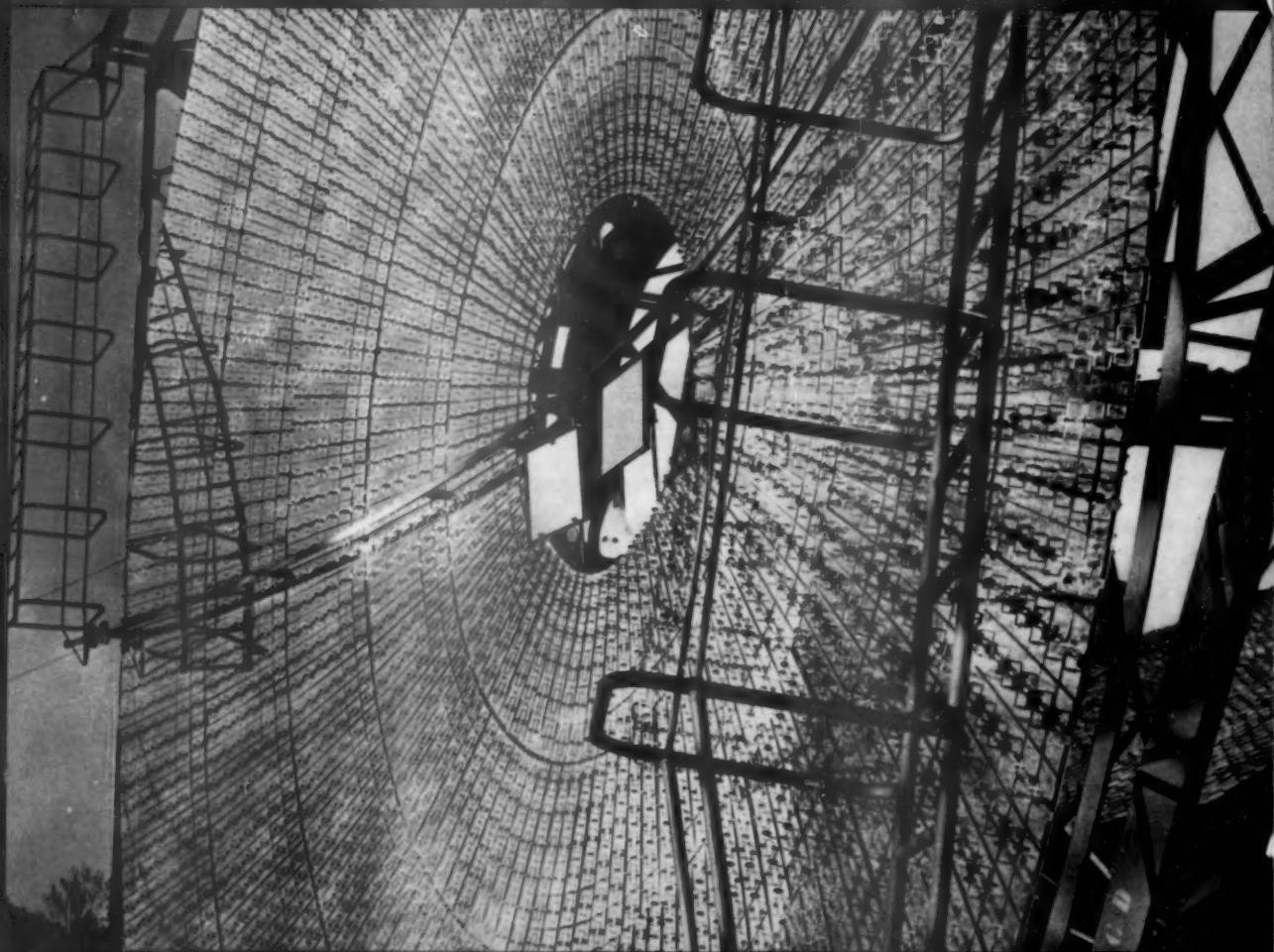
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May 21, 1955

VOL. 21 NO. 21

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Solar Furnace

See Page 328

A SCIENCE SERVICE PUBLICATION

PSYCHOLOGY

Stress to Fight Mental Ill

Revolutionary treatment for schizophrenia, sometimes called split personality, is to expose the patient gradually to the normal stresses of living.

► A "NEW and revolutionary" treatment for the child who is on the verge of developing the serious mental disease, schizophrenia, was proposed by Drs. Curtis T. Prout and Mary Alice White of the New York Hospital, Westchester Division, White Plains, N. Y., before the American Psychiatric Association in Atlantic City, N. J.

Schizophrenia is sometimes called the split personality disease, though actually patients do not always show that trait. Often they are completely withdrawn from the world of reality, apparently preferring to live in a dream world of their own.

With the new treatment, psychiatrists would stop their current practice of looking for defects in parents' handling of a child who seemed pre-schizophrenic. Instead, the child would be gradually exposed to normal stresses, to strengthen his ability to withstand them.

"He would be trained to independence and armored against his over-sensitivity," as the psychiatrists put it.

The idea for the new revolutionary treatment came from a study of brothers and sisters of 30 schizophrenic patients. From this study came such opposite attitudes toward injuries as the following:

"When I had an ovary taken out I thought my life was ruined," said a woman with schizophrenia. (Loss of one ovary does not bar a woman from motherhood or normal sex life.)

"I didn't feel handicapped because I lost one eye," said the patient's normal younger sister.

In every one of the 30 cases, the patient and brother or sister grew up in the same family and same environment. But their reactions to ordinary difficulties were markedly different. So also were their personalities. The striking differences were evident when patient and brother or sister were quite small.

Their mothers described the patients as, "sensitive; sweet; shy; serious; introspective," while the brothers and sisters were, "independent; outgoing; rebellious; better able to stand on their own feet."

The pre-schizophrenic child's inherent personality, apparently, caused him to react abnormally to common experiences. His parents in turn, responded to his desire for support by over-protecting him. The result was a dependent, passive youngster, unprepared to cope with the ups and downs of everyday living.

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RADIO ASTRONOMY

Radio Source In Cygnus

► A NEW, strong radio source has been discovered in the Great Loop in Cygnus, the swan, a heavenly object observed photographically by astronomers for several decades.

The discovery offers an "unrivalled opportunity" to study the correlation between radio emission and visible structure, Drs. D. Walsh and R. Hanbury Brown, radio astronomers at the Jodrell Bank Experimental Station, Cheshire, England, stated.

Radio "stars" send out radio waves, picked up on earth by receivers called radio telescopes. About 200 such sources are known, but only five of them have previously been identified with visible nebulosities within the Milky Way galaxy, in which the sun is but one of billions of stars.

A few other radio sources have been identified with heavenly objects far beyond the Milky Way galaxy.

The new, intense radio "star" is located just below the eastern wing tip of the swan, a constellation that forms an imaginary picture in the sky of a giant bird with a stretched out neck, widespread wings and

trailing legs. Cygnus lies in the direction of one arm of the spiral-shaped starry pinwheel of the Milky Way.

Radio waves from the approximate position of the Great Loop in Cygnus were caught with the 218-foot radio "saucer" operating at 92.5 megacycles, Drs. Walsh and Brown reported in the British scientific journal, *Nature* (May 7). "More positive identification" of the radio and visible sources as identical must await further exploration of this region in Cygnus with a more accurate radio telescope, they said.

From photographic studies, this part of Cygnus has been named the Great Loop. It consists of several nebulae, including two that are faintly connected and seem to form a wreath. The wreath is believed to have been formed by material expelled from a great nova that blazed up about 150,000 years ago.

The Great Loop remarkably resembles a mass of nebulosity known by its star catalogue number, IC 443, in the constellation of Gemini, the twins. Discovery in 1954 that this is also a radio source prompted

Drs. Walsh and Brown to scan the Great Loop in Cygnus for radio waves. (See SNL, Jan. 30, 1954, p. 66.)

Other radio sources identified with galactic nebulosities are the Crab Nebula in Taurus, also the remnant of an exploding supernova and one of the brightest such objects ever found, and sources in the constellations of Cassiopeia, Puppis and Auriga.

The angular size of the new radio source is "at least as great as that of the Loop," and is shown in their report by a circle of diameter three degrees. When this estimated position is superimposed on the nebulosities forming the Great Loop, the radio source lies within and somewhat toward its lower edge.

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MEDICINE

Anti-Cancer Serum From Horse Works in Lab

► HUMAN CANCER cells growing outside the body in laboratory flasks can be killed by a serum from a horse, Drs. Bertil Bjorklund of the State Laboratory of Bacteriology, Stockholm, Sweden, and Drs. John and Ruth Graham of Vincent Memorial Hospital, Boston, announced at the meeting of the Society of American Bacteriologists in New York.

The anti-cancer serum was made by repeatedly injecting cancers pooled from 56 persons under the skin of a horse. After treatment to remove antibodies toward normal human blood plasma constituents, the horse anti-cancer serum was tested against freshly isolated cancer and normal cells from the same person.

After one day the cancer cells showed destructive changes which developed gradually and in some cases went on to complete destruction. The action was selective for the cancer cells, leaving normal cells unharmed. The scientists are now at work trying to learn more about the process.

Science News Letter, May 21, 1955

MEDICINE

Find Chemical Changes In Blood in Leprosy

► CHANGES IN the proteins in the blood of patients with Hansen's disease (leprosy) were reported by Drs. Rudolph J. Mueller, Catherine Goetz and Lawrence L. Swan, and Sister Hilary Ross of Charity Hospital, New Orleans, and U. S. Public Health Service Hospital, Carville, La., at the meeting of the International Association of Medical Museums at Houston, Tex.

The changes were in the globulins of the blood serum. In early stages of the disease these were only slightly increased. In more advanced stages severe abnormalities showed in the serum protein pattern.

The studies, it was said, might lead to a diagnostic test, earlier detection and possibly a more effective treatment.

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GENERAL SCIENCE

Subtle "Book Burning"

Government is abandoning how-to-do-it books, among others, published with Federal money. They are expected, however, to appear in private bookstores at higher prices.

This is the first of an exclusive series on development that affects every reader. These articles report what is happening to popular and useful books from Government departments that have been obtainable from the Government Printing Office.

▶ THERE IS a subtle "book burning" under way in Washington. Informative and inexpensive books, published by the Government for the public, are being withdrawn from further publication, or being re-edited.

Principal targets are the how-to-do-it books. A few have already been discarded and more can be expected to disappear from Federal book stores. They can be expected, however, to turn up again at the book stores of private publishers, at higher prices.

One of the Government Printing Office's how-to-do-it books, a best seller for 24 years, is now in its death throes. "Care and Repair of the House," which had a profitable and record-breaking sales in 1954 of 33,500 copies, will not be reprinted.

The book is being discarded because "it seems to be competitive with privately published books," and because it deals with a subject that is now considered "hardly appropriate with the fields of the Department of Commerce," Donald R. Burgess, director of the Department's office of publications management, told SCIENCE SERVICE.

The Department of Commerce has the final say on what material written by its staff is to be published by the GPO.

Mr. Burgess explained that the do-it-yourself market has expanded in recent years and there are many "good" privately published books available. He said that there is a "trend" to take the Government out of competition with private industry, where private firms are doing the job.

Until 1950, when the 204-page, 60-cent do-it-yourself guide was completely revised, it had sold 175,000 copies. Since its revision, it has sold more than 114,600 copies. Its sales have steadily increased since it was first published in 1931.

But "Care and Repair of the House" will not be lost to the public. McGraw-Hill, New York publishers, are planning to publish a completely revised, lengthened, and heavily illustrated edition of it to sell for "\$3.95 or more."

Steve Gibson Scheaffer, a technical book editor at McGraw-Hill who is responsible for the revision of the book, told SCIENCE SERVICE that it was being re-edited under contract by the late Mrs. Louise D. C. Nobel, a former employee of the National Bureau of Standards who died on March

11, 1955. Mrs. Nobel had helped revise the 1931 Government edition in 1950. Mr. Scheaffer said that three-fourths of the Government book had been re-worked, and that the New York publishers were "certainly interested in publishing it if there is a possibility for completing it."

The book was originally written by Vincent B. Phelan, a former National Bureau of Standards employee, who is now retired and living in Santa Barbara, Calif. When Mr. Phelan was notified by SCIENCE SERVICE that his work was being discarded, he said that "the public deserves a better break than this."

"There is nothing like it on the market," the author stated. "Its reprinting should not be stopped. The book's sales record speaks for itself and there is certainly a continued demand for it here in the West."

Mr. Phelan said that it was still "up-to-date" and that it had been revised with the help of the Bureau's experts and with the addition of many new illustrations.

At present, only several hundred copies of the book are left in Government stock. When they run out, the plates will be put in storage and, unless the Department of Commerce requests the GPO to reissue the book within two years, the plates will be destroyed.

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AERONAUTICS

Heat Waves Direct New Missile to Its Target

▶ THE LATEST in guided missiles hunts down its target with heat waves. The target's own warmth cues the projectile in.

Such a missile might lock on to isolated objects, ships at sea or planes in the air. With an atomic warhead, it might search out and dive into the industrial heart of a city.

Missiles that seek out objects by infrared or heat waves are reported to have been tested at the Woomera Rocket Range in Australia, and the United States is working on its own version, details of which are kept a carefully guarded military secret.

Though the electronics is complicated, the principle is simple. Metals and other building materials act as partial black bodies absorbing heat from the sun and become hotter than their environment. Ships become hotter than the sea and cities hotter than the surrounding countryside. The missile detects this tell-tale heat concentration.

A modified "snooperscope" might provide directional guidance for the missile. This device can convert invisible infrared radiation to a visible image. A person can see objects lit by infrared in a completely darkened room through such a "snooperscope." The old "sniperscope" version was used in Korean war night fighting.

Experts report that Britain has been conducting experiments with an infrared guided missile for some time. De Havilland Aircraft Company worked up the model tested in Australia.

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UP AND AWAY—The McDonnell XV-1 convertiplane, which can take off like a helicopter and fly like a conventional plane, is shown during the flight in which it completed the world's first helicopter-to-airplane conversion. (See SNL, Feb. 19, p. 114.)

MEDICINE

Bronchial Asthma Relief

► A NEW drug first found good against rheumatism is also effective in relieving bronchial asthma and swollen lung tissue, the American College of Physicians was told in Philadelphia.

The drug is metacortandracin, now called Prednasone, a relative of cortisone having fewer of its undesirable side effects.

Dr. Alvan L. Barach, professor of medicine at Columbia University's Medical School and associated with Presbyterian Hospital in New York, described results with the drug on 120 patients during the past six months. Half had bronchial asthma, the other 60 suffered from swollen lung tissue, or pulmonary emphysema.

The "unique difference" of Prednasone from cortisone, Dr. Barach reported, "is its capacity to produce relief of bronchospasm and to exert an anti-inflammatory effect without salt retention and without loss of potassium."

In 20 of 30 patients in whom cortisone had previously resulted in some adverse

effects, he said, use of the new drug was followed by a "marked increase" in ability to exercise without labored breathing.

Six out of eight patients also lost three to nine pounds, probably by removal of salt and water from the lungs. This effect was "never encountered previously with the use of cortisone," Dr. Barach said.

He cautioned that other side effects of cortisone have been found with Prednasone and that special care should be taken to prevent ulcers and broncho-pulmonary infection. Prednasone was developed by chemists at the Schering Corporation, Bloomfield, N. J.

Another "important" advance in the treatment of patients with swelling of lung tissues, Dr. Barach said, is restoration of diaphragm function.

Training in breathing in the head-down position brings this result, and it can be enhanced by use of the Gordon-Barach Emphysema Belt.

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The ROTI's long range enables it to cover many types of missile problems from a single stationary vantage point far away.

Recording experimental flights by telescopic instruments gives the most complete and accurate information on missile velocity, acceleration, attitude and spatial position. Other methods currently used to track missiles are telemetering, in which the missile radios instrument readings to the ground, and radar.

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The angler fish has a flap of skin on its head which it wiggles to lure smaller fish; when they come within range the angler fish gobbles them down.

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AERONAUTICS

"Bomb" Tests Fuels

► A "BOMB" that does not blow up is being used to help oil scientists produce a more powerful, quicker burning gasoline.

It is a metal test chamber that can be heated to temperatures from 400 to 1,500 degrees Fahrenheit and into which fuel mixtures are injected. Characteristics of the ensuing explosion are recorded by instruments attached to the constant-volume bomb.

Thus scientists with this tool, described at the meeting of the American Petroleum Institute in St. Louis, Mo., can learn more precisely how fast new fuels explode, how long before ignition begins and what temperatures are needed to begin the explosion. Advantages of the device were described as follows:

1. Only a small quantity of the fuel is needed for each test, making it possible to study pure hydrocarbons which frequently are available only in limited quantities.
2. Tests can be made under closely controlled temperature and pressure conditions.
3. The temperature and pressure can be varied over wide ranges.
4. The composition of the atmosphere of the bomb can be varied easily.

Measurements with various fuels using the new technique were reported by M. A. Elliott of the Illinois Institute of Technology, R. W. Hurn of the U. S. Bureau of Mines and H. M. Trimble of Phillips Petroleum Co., Bartlesville, Okla.

Ignition delay usually decreased with increasing bomb temperature, but this behavior varied widely for different hydrocarbon structures, the scientists found. The

longer the carbon chain in the molecule, the less the delay.

Hydrocarbons with branched-chain molecular structure were apparently less temperature sensitive than paraffins or naphthenes. The various fuels tested differed markedly in their rates of heat release.

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AERONAUTICS

"Shot Gun" Telescope To Track Missiles

► A DOUBLE-BARRELED telescope that can record a golf ball's flight eight miles away will go to work for the Air Force to track guided missiles.

Stationed 50 miles apart, two of these Recording Optical Tracking Instruments (ROTI's) can pinpoint a missile with a maximum error of only nine inches in a mile. Accurate radar systems are usually off about nine feet in a mile.

The first ROTI is scheduled to be installed at the Holloman Air Force Base, Alamogordo, N. M.

The two 16-in-diameter telescope units on each ROTI have different focal lengths and are mounted one above the other. During operation, both color and black-and-white slow motion movies of the missile's flight can be made while a third camera photographs the telescope dial readings.

Mounted like a cannon, the ROTI focuses on the moving target using a mechanism that compensates for the response time lag of the human operator.

PSYCHIATRY

More or Less Shock?

Psychiatrists report success with new shock techniques for treatment of mentally ill. "Photo-shock" and strong and light electrical doses are among methods tested.

► NEW AND, it is hoped, better ways of shocking mentally sick minds back to health were reported at the meeting of the American Psychiatric Association in Atlantic City.

Some, such as Dr. Bernard C. Glueck Jr. and associates of Ossining, N. Y., think more intensive treatment with conventional electroshock gives better results.

They have been giving three "grand mal," or very strong convulsions, daily. This is continued until the patient has gone back to infantile behavior with abnormal neurological signs. Recovery from this state takes about three weeks. During this period many of the serious emotional conflicts involved in the illness may be uncovered.

A "significant finding" is the continued improvement in adjustment these patients make as the years go by. After five years Dr. Glueck found 18 of 34 recovered or much improved, 10 somewhat improved and six unimproved. This, he said, is a much better response than from other forms of organic, or shock, treatment. Associated in this work with Dr. Glueck were Drs. Harry Reiss and Louis E. Bernard.

Going in another direction with shock treatment, Dr. Joseph Epstein of New York is reporting good results, without the danger of broken bones or the after effect of disturbed memory and confusion, from his Monopolar method of treatment. Fractions of the amount of electric current used in bipolar electroshock accomplish the result because, Dr. Epstein explains, the current is made to penetrate deeply and selectively into the brain area the psychiatrist thinks needs the shock stimulation.

Instead of electric current, a flashing light is used for "photo-shock" treatment by Drs. George A. Ulett and Kathleen Smith at Washington University School of Medicine, St. Louis. Dr. Goldine Gleser of Cincinnati worked with them.

The flashing light shock is given after patients have had injected into their veins the drug, Azazol.

This treatment was given to 21 patients acutely ill with depression or schizophrenia. Results were compared with those in 21 similar patients given routine hospital care, another similar group given electroshock, and still another group given less intensive "photostimulation," in which smaller quantities of the drug were used and the light flashes were interrupted oftener.

Photo-shock and electroshock gave better results than either photostimulation or routine hospital care. More than half the patients given photo-shock were home and engaged in their normal occupations three and six months after the treatment.

Electroshock can help some severely sick

patients who "get stuck" in non-constructive or disruptive persistent activity during intensive psychiatric treatment, Drs. John D. Patton and Lewis B. Hill of Sheppard and Enoch Pratt Hospital, Towson, Md., report.

The periods of getting stuck in treatment come when the patients have reached the point where they cannot stand any further breaking down of the faulty, or crazy as some might say, defenses they have built against a world or life situation they fear. They react with violence or confusion or repeated denials and defiance or insist on dwelling on delusions.

At this point the appropriate amount of electroshock interrupts these refractory patterns and lets the patient again gain help from psychiatric treatment.

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PHYSICS

Split-Second Life of Heavy Meson Varies

► UNSTABLE PARTICLES known as heavy mesons, whose existence is measured in billionths of a second, can be divided into two groups on the basis of their lifetimes, Dr. George T. Reynolds of Princeton University's Palmer Physical Laboratory reported to the American Physical Society meeting in Washington.

Resulting from very high energy nuclear smash-ups, the unstable particles are observed in cloud chambers at Echo Lake, Colo., at an altitude of 10,600 feet. Dr. Reynolds presented the first positive evidence that these particles could be divided into sub-classes according to their lifetimes.

One group of particles, called K mu's, lives only eight-billionths of a second, Princeton scientists have found. Another class, the theta charged particle, decays with a lifetime of about five ten-billionths of a second.

The particles are studied in photographs made of tracks they leave in the super-saturated water vapor of cloud chambers. Paths are marked by condensed droplets.

Members of the Princeton group making the measurements, besides Dr. Reynolds, included Drs. J. Bullam, H. Arnold, S. B. Treiman, R. R. Rau and A. L. Hodson.

New things scientists are learning about the group of particles called K -mesons used to change from month to month, but now they are different from week to week, Dr. Maurice M. Shapiro of the Naval Research Laboratory, Washington, reported.

One of the K particles, a positive tau meson, left a history of four disintegrations



BUTTERFLY REPAST—In an unusual closeup of a common sight, a Great Spangled Fritillary is shown perched on a thistle, one of many kinds of flowers it visits, avid for nectar and moisture.

in photographic emulsions flown high above the equator.

Not only is the birth and death of this tau meson recorded, Dr. Shapiro said, "but also the birth and death of its pion (a light-weight unstable particle) children, its muon (a different light-weight unstable particle) grandchildren, and the birth of its great grandchildren—the electron offspring of the muons."

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GENERAL SCIENCE

Mechanical Brain Wins Top Science Fair Award

► THE MECHANICAL brain that 16-year-old Rosemary Patricia Och of Bayley Ellard High School, Madison, N. J., created won for Miss Och one of the top awards at the National Science Fair in Cleveland.

The awards were announced by Watson Davis, director of SCIENCE SERVICE, which administers Science Clubs of America and the National Science Fair.

Exhibits in the Sixth National Science Fair, held from May 12 to 14, were of such excellence that 30 additional awards of \$25 each were made.

The top awards consist of \$125 in scientific books and equipment of the winners' choosing. Besides Miss Och's the following won these top awards:

Johanna Hackman, 17, Radford (Va.) High School; Robert Scott Dunning, 17, Norview High School, Norfolk, Va.; and Vladimir Vadim Baicher, 17, Pasadena (Calif.) High School.

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MEDICINE

Find Polio Virus Antibodies in Cows

► **DISCOVERY** OF antibodies to all three types of polio in blood serum of cows was announced by Drs. P. Bartell and M. Klein of Temple University, Philadelphia, at the meeting of the Society of American Bacteriologists in New York.

Cats, dogs, lambs and calves lacked the polio antibodies. Chickens, hogs, horses and steers showed a little. Cows, however, showed the highest number of positive reactions in the tests for the polio antibodies.

No virus itself was found in several hundred specimens of spinal cord, spleen, lymph node or feces from cows, steers and calves.

Where the antibodies came from is not known, but the scientists conclude that antibodies to polio viruses are "widely distributed in nature, with a peculiarly high concentration" in the blood serum of cows.

Antibodies, as most persons now know in these days of polio vaccination, are the substances that protect against the virus. They are formed in response to invasion of the body by the virus or, as in the case of vaccine, in response to injections of killed virus.

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ELECTRONICS

Tin "Whiskers" Studied At Very Low Temperature

► **TIN "WHISKERS"** that grow off the surface of tin much as whiskers grow on a man's face are being studied at temperatures near 459 degrees below zero Fahrenheit by scientists at the National Bureau of Standards.

Only a millionth of an inch in diameter, the tin crystals are being made into what are probably the world's smallest electrical circuits.

Experiments with them at temperatures within one degree of the very lowest attainable are expected to extend present knowledge of superconductivity. Certain metals, including tin, lose their electrical resistance completely at these very low temperatures, a phenomenon known as superconductivity.

Because of their microscopic size, tin whiskers exhibit characteristics different from larger specimens of tin when going through the superconducting state. By making the minute electrical circuits containing tin whiskers, then cooling them to superconducting temperatures, O. S. Lutes and Dr. E. Maxwell of the Bureau staff, are studying this remarkable class of materials.

Although superconductors have no immediate practical applications, there is a possibility that, if materials could be found that are superconducting at considerably higher temperatures, resistance-free telephone circuits using little or no power might be constructed.

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MEDICINE

Anti-Virus Drugs Seen

New chemical stops influenza virus from multiplying in test tube. Gives doctors hope that new wonder drugs will provide weapons against influenza, common cold and polio.

► **HOPEFUL PREDICTION** for early discovery of drugs to stop viruses such as those causing influenza, colds, and perhaps even polio appeared in a report by Dr. Igor Tamm of the Hospital of the Rockefeller Institute for Medical Research, New York, to the Society of American Bacteriologists meeting in New York.

In test tube experiments, influenza virus was completely stopped from multiplying by a compound made from the chemical, benzimidazole. The cells in which the flu virus was growing were not harmed at all by this new compound.

None of the benzimidazole derivatives has yet proved useful in treating people with virus infections, Dr. Tamm stressed.

Scientists reported on first steps toward this. Newcastle disease virus, cause of a frequently fatal epidemic in poultry which can also cause eye inflammation in humans, can be inactivated by the antibiotic, subtilin, Drs. A. J. Salle, G. D. Jann and C. W. Molander of the University of California have found.

Chickens can even be vaccinated against this virus when subtilin is used to kill the virus for the vaccine.

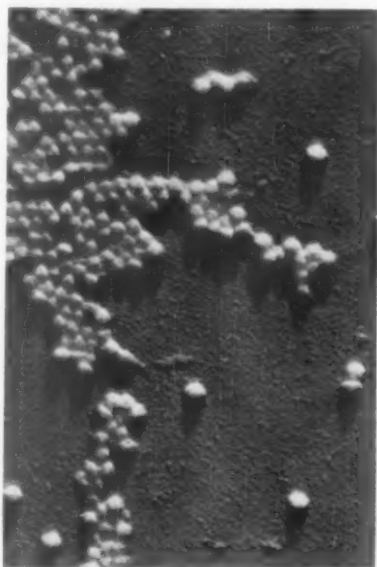
Two other antibiotics, streptothricin and novoficin, and ethionine, a chemical related to an amino acid, are effective against Newcastle disease virus in the test tube, Drs. C. O. Gitterman and A. H. Larsen of Merck and Co. reported.

Viruses that cause ailments commonly diagnosed as virus pneumonia, grippe, severe colds, catarrhal fever and acute sore throat are uniform spherical particles measuring 1/250,000 of an inch, Drs. M. R. Hilleman, A. J. Tousimis and J. H. Werner of the Army Medical Service Graduate School, Washington, D. C., said.

They showed electron microscope pictures of the spherical virus particle, called R1-67 virus, that attacks about three-fourths of recruits in winter during their first eight months of basic training and which is also widespread among civilian populations.

Electron microscope pictures of AD-6, another respiratory disease virus found in human adenoid tissue by Public Health Service scientists, show it to be about the same size and shape as the military R1-67.

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SPHERICAL VIRUS — These tiny balls, each only 1/250,000th of an inch in diameter, are the cause of some colds. Called R1-67 virus, they were photographed from an electron microscope image.

But he thinks development of anti-virus drugs for humans may not now be too far off.

Benzimidazole is a chemical building block for many important living structures.

Bacteriologists have hope, also, that some antibiotics may yet be found which can stop virus diseases as the antibiotics now stop many other infections. Two groups of

GENERAL SCIENCE

A Dry Huff and a Puff Make Smoking Easier

► **PUFFING ON** unlighted cigarettes helps to make smoking lighted cigarettes easier, it was reported at the 33rd annual Virginia Academy of Science meeting at Madison College in Harrisonburg, Va.

Airflow through an unlighted cigarette serves as a means for telling how much ease or difficulty a smoker is going to have when he smokes one, P. M. Pederson and E. S. Harlow of The American Tobacco Company's Richmond research laboratory said. This is one of the testing methods used by manufacturers.

Tests have shown, they reported, that airflow is not affected by the amount of moisture nor the width of the tobacco strands in a cigarette if weight, length and circumference are kept constant.

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PSYCHOLOGY

Cruelty From Gray Matter

Experiments indicate that the cerebral cortex of the brain is the seat of unprovoked violence and cruelty. Reason for delinquency may be delayed brain development.

► UNPROVOKED ACTS of violence and cruelty, including murder, may be due to delayed growth and development of the brain.

Brain wave studies in which "waves of violence" were discovered are the basis for this new theory. The studies by Dr. Chaskiel Grossman, of the Veterans Administration Hospital in Pittsburgh, were announced by the Veterans Administration.

Many cases of unmotivated violence have been related to abnormal functioning of the brain as shown by the abnormal brain wave recordings, first discovered by University of Illinois scientists in 1951.

Significantly, Dr. Grossman points out, the murder cases involved youngsters who killed a playmate or a parent and were murders described as especially cruel and without provocation.

Until recently, not much was known about the origin of the unusual "violence" brain waves. Dr. Grossman has now been able to reproduce them in animals by blocking the functions of superficial layers of the gray matter covering the brain, called the cerebral cortex. The blocking occurred whenever certain drugs with a depressing action were applied to the cortex. The blocking was not permanent, disappearing as the action of the drug tapered off.

This, Dr. Grossman thinks, points to the gray matter covering the brain, that is, the cerebral cortex, as the place where the violent behavior disorder has its roots.

Previous theory linked unprovoked acts of violence with an epileptic disturbance in the hypothalamus deep within the brain. Dr. Grossman stressed that his study does not support the theory that the abnormal brain wave of violence and the violent behavior are directly caused by epilepsy.

Some violent acts of destruction and murder, he thinks, may be related to a temporary or passing impairment of brain activity caused by a sudden blocking of the functions of higher discriminatory mechanisms, leaving primitive emotions unchecked.

Or immaturity of the brain, caused by a delay in development of the superficial layers of gray matter, may be the basis of the disorder.

"A close relationship may exist between some cases of social delinquency and delayed physiological and anatomical development of the human brain," Dr. Grossman states. "However, the final evaluation of this relationship and the full appreciation of these subtle development 'defects' are still difficult since our knowledge of the physiology of maturation of the human brain is largely spotty."

Extensive brain wave examinations of a large number of young persons with both normal and abnormal behavior will be necessary to make a statistically significant evaluation possible.

The abnormal brain waves of violence are technically called positive spikes or bursts. They are different from those seen in normal persons or in patients with brain disease from a stroke or from a tumor.

Science News Letter, May 21, 1955

GEOPHYSICS

Ancient Glaciers Clocked

► THE SLOW, relentless movement of the great sheets of ice in the Wisconsin glaciation many thousands of years ago has been clocked and dated. It began 25,000 or more years ago, reached a maximum between 20,000 and 18,000 years ago and was in retreat about 13,000 years ago.

Dating was done with the radiocarbon method. Ages were found for the wood of actual trees knocked down by the advancing ice as it moved from Canada north of the Great Lakes through Ohio, Indiana and into Illinois. An orderly procession of dates was obtained from 27,000 years ago in Canada to 25,000 years ago at Cleveland, Ohio, and 23,000 years ago in Sidney, Ohio, to 19,000 years ago at its southern-most extent.

Dr. Richard Foster Flint of Yale University and Dr. Meyer Rubin of the U. S. Geological Survey, Washington, report the findings to *Science* (May 6). Dr. Hans Suess of the U. S. Geological Survey did the actual dating.

The radiocarbon dating method used is one developed by Dr. Suess which first converts the solid carbon of the wood to acetylene gas. The older radiocarbon method using solid carbon, as developed by Dr. W. F. Libby of the University of Chicago, now on leave to serve with the Atomic Energy Commission, could date samples only as old as 25,000 years. Dr. Suess' gas method pushes back the calendar to 50,000 years although he does not attempt to put an exact date on samples older than about 30,000 years. He just calls them "older than 30,000 years" or "older than 40,000 years."

The new calendar provides scientists with the first accurate dating of the advance of the great Wisconsin ice sheet. Geologists have previously dated its retreat through the study of varves, or layers of silt left behind as the ice melted away.

MEDICINE

Devices to Improve Therapy With X-Rays

► ADVANTAGES OF improving X-ray therapy by devices to brighten fluoroscopic screens were reported to the Fifth Inter-American Congress of Radiology meeting in Washington by Dr. Russell H. Morgan of the Johns Hopkins Medical School, Baltimore, Md.

These devices will also be of "great value" in radiation treatment, he said.

Fluoroscopic screens are used to make sure that the patient is correctly placed in the X-ray beam, but the clarity is "not too satisfactory," and their use is not widespread.

Intensifiers now under development overcome this and other difficulties, he said.

Science News Letter, May 21, 1955

ASTRONOMY

Two Major Observatories Join in Solar Studies

► TWO MAJOR observatories, those of Smithsonian Institution and Harvard University, are teaming up to study the explosive energy of the sun and its impact on all layers of the earth's atmosphere.

They plan a concentrated effort to increase man's knowledge of the sun, of practical value in radio communications, weather forecasting and rocket flights, and of great theoretical interest for astronomers and geophysicists.

Dr. Fred L. Whipple, Harvard astronomer, will become director of the Smithsonian's Astrophysical Observatory on July 1, Dr. Leonard Carmichael, secretary of the Smithsonian, announced. Dr. Whipple succeeds L. B. Aldrich, who is retiring.

Headquarters of the Astrophysical Observatory will be moved from Washington to Cambridge, Mass., at the same time, to enable astronomers to coordinate their work.

One of the major contributions of the Smithsonian's Observatory has been the measurement over many years of the amount of solar energy striking the outer edge of the earth's atmosphere, known as the solar constant. This work was originated by Dr. C. G. Abbot, a former secretary of the Smithsonian, and continued by Mr. Aldrich.

Science News Letter, May 21, 1955

PUBLIC HEALTH

Isolate Gases That Form Smog Irritants

► THE GASES in smog that form irritants in sunlight have been isolated.

The fumes are primarily hydrocarbons, gasoline and oil products, Dr. Lawrence M. Richards of the Stanford Research Institute, Stanford, Calif., told a meeting of the American Petroleum Institute in St. Louis.

From smoggy air pumped into his laboratory in Los Angeles, he separated the gases in a liquid oxygen-cooled trap.

Dr. Richards showed that the sun's ultra-violet light triggers the reaction producing the powerful oxidants. Chemists believe that these hydrocarbons react with nitrogen oxides to produce ozone, a very strong gaseous oxidant. The ozone, which is a form of oxygen with three atoms to a molecule instead of the ordinary two, may be the cause of the watering eyes common in Los Angeles during smog.

Outside air, pumped through an irradiated glass vessel, was analyzed before and after exposure to the laboratory light. When unfiltered air passed through the vessel, oxidizing substances and nitrogen oxide were formed. The isolated hydrocarbons injected into pure air also produced this reaction when irradiated.

But when the smoggy air was first filtered through a liquid oxygen trap which produces very low temperatures the reaction was halted because the hydrocarbons had condensed out. The guilty gases were reclaimed from the trap by heating it, and their irritant-forming tendency was confirmed.

Filters with activated carbon, a black adsorber used in gas masks, and hot copper oxide also removed the fumes, the individual hydrocarbons of which have not yet been identified.

Science News Letter, May 21, 1955

INVENTION

French Sun Furnace Receives U. S. Patent

See Front Cover

► THE INVENTION that has made possible the world's largest sun furnace, nestled high in the French Pyrenees, has been patented.

Felix Trombe, director of the National Center for Scientific Research in Paris, was granted U. S. patent No. 2,707,903 for inventing giant composite mirrors capable of trapping the sun's energy. To achieve this feat, M. Trombe designed a composite mirror made of several hundred little mirrors. Each of the little mirrors, he found, if made of pliable glass, could be shaped by permanent mechanical fingers attached to its back. This would then form each into the shape intended for the composite mirror itself. It is possible, he states, "to use thinner glass plates and, owing to the effect of

the mechanical stresses applied to these mirror plates, they keep their shape much more easily than flat elements, despite the action of wind, vibrations or thermal expansion."

The French sun furnace shown on the cover of this week's SCIENCE NEWS LETTER has been in operation for over two years. It consists of two great mirrors, one of which is a 105-square-yard parabola, a product of M. Trombe's invention. The modern solar energy laboratory in the mountains is capable of generating a temperature of 5,432 degrees Fahrenheit. French scientists are using the sun furnace to produce and study some minerals which are made at temperatures too high for ordinary furnaces.

The invention's patent rights were assigned by M. Trombe to the National Center in Paris.

Science News Letter, May 21, 1955

ANTHROPOLOGY

Scientists Avoid Atlanta As Segregation Protest

► WHEN THE scientists of America meet next December in Atlanta, Ga., for their big Christmas meetings, one whole section of the American Association for the Advancement of Science, consisting of 484 members, will be absent. Reason: segregation of Negroes.

Section H, Anthropology, has voted by mail ballot to abstain from meeting this year because of the discrimination that would be shown in Atlanta toward Negro members. Dr. Montague Cobb of Howard University, a prominent officer of the section who is a distinguished Negro anthropologist, refrained from voting because he considered himself prejudiced.

The American Association for the Advancement of Science arranged with Atlanta hotels for certain concessions in the way of fair treatment for Negro members of the Association. All technical sessions of the Association and affiliated societies will be open to Negro as well as white members. And all social functions such as the reception following the presidential address and a traditional big smoker will be open to both races. Buses hired by the Association to transport members to certain sessions will be non-segregated.

But state laws in Georgia forbid housing of Negroes in white hotels, serving them in white restaurants or seating them with whites on street cars. Even taxis are segregated; some will not carry Negro passengers and others refuse whites.

The nation's anthropologists, most of whom hold that the idea that one race is superior or inferior to another is a dangerous myth, have now taken formal action in protest against such segregation.

The action of Section H of the AAAS was supported by a resolution passed unanimously by the American Association of Physical Anthropologists and also by action of the Anthropological Society of Washington.

Science News Letter, May 21, 1955

IN SCIENCE

ENGINEERING

Funnel-Shaped Drains To Save \$1,000 a Mile

► FUNNEL-SHAPED DRAIN inlets for city streets designed at the University of Illinois can save \$1,000 a mile in new street construction.

Tests on the campus showed that the new inlets to take water from gutters are more efficient than rectangular drains and cost half as much to install.

Thirty inches long, 12 inches wide and 12 inches deep, the inlets can be cast in concrete from re-usable metal forms.

The drains were developed by Prof. John C. Guillou of the university's civil engineering department and Norman W. Nester, civil engineer of its physical plant department.

Science News Letter, May 21, 1955

MEDICINE

Removing Gland in Head Controls Breast Cancer

► WIDESPREAD BREAST cancer can be temporarily controlled by an operation to remove the pituitary gland at the base of the brain, six New York City physicians and surgeons reported at the meeting of the Association of American Physicians in Atlantic City, N. J.

Of 43 women with advanced breast cancer in whom the pituitary gland was removed, 20 showed marked improvement, 17 were considered failures and six were treated too recently to be evaluated. Fifteen of the 20 improved patients are still in remission at the present time. The longest remission to date has been 20 months.

Cancers of the breast that could not be removed by operation shrank, as did cancers that had spread to bone, bone marrow, lung, brain, spinal cord and skin. Patients were able to walk again, to breathe more easily and to return to normal activities. Bones broken because the cancer had destroyed bone tissue healed again. Patients felt good generally.

The results of the treatment, besides the new, if temporary, lease on life given the patients, suggest that hormones of the pituitary gland may play a hitherto unsuspected role in the growth of some kinds of cancer.

The studies reported were made by Dr. Olof H. Pearson of Memorial Center's Sloan-Kettering Institute, Dr. Bronson S. Ray, neurosurgeon of New York Hospital-Cornell Medical Center, and Drs. Charles G. Harrold, Charles D. West, Min-Chu Li, John P. Maclean and Mortimer B. Lipsett of Memorial Center.

Science News Letter, May 21, 1955

THE FIELDS

ENTOMOLOGY

Locusts Fed Isotopes To Study Their Habits

► LOCUSTS ARE being corn-fed radioactive isotopes by British scientists to study their habits.

Experiments with both young and adult locust hoppers show that after being fed with radioactive phosphorus-32 mixed with corn, bran or grass, the ravenous insects can be picked up and tracked with a Geiger counter. "Hot" isotope labeling is seen as a new method of studying insect populations, death rates, dispersal and habits.

It was found that both young and old radioactive-fed locusts could be "counted" three to five weeks later. Treated adults could be recognized at a distance of ten inches for two weeks. With both groups, too, it was found that the insects lost about half their radioactivity each in the first 24 hours. Radioactivity loss after that time, however, was negligible.

The study, made by Dr. H. B. D. Kettlewell of the Department of Zoology at the University of Oxford, and reported in *Nature* (May 7), also showed that treated hoppers had a slightly higher death rate than untreated ones.

"Much could be learned about hopper movement and death rate by this method," Dr. Kettlewell reported, "the only one at present available."

But, he pointed out, until an automatic recording device, such as an insulated radioactive-sensitive film of known length, can be found, radioactive isotope labeling costs too much and has no advantages over well-tried paints, which require no specialized observers.

Science News Letter, May 21, 1955

PSYCHOLOGY

Delinquency, Old Age Ills Have Same Cause

► THE RISING tide of crime among juveniles may have the same origin as the increasing rate of mental illness in old age.

Broken homes and an inability to take part in the normal activities of family life which give a feeling of belonging have been blamed for the increasing number of teenagers who get into trouble.

Similarly, a lack of participation in the work and living of the family and community may give rise to the mental ills of old age. More than one out of three first admissions to state mental hospitals today are persons 60 years old or over.

These problems were among those discussed at a research conference under the joint auspices of the National Institute of Mental Health and the American Psychological Association.

Among the gravest of the problems needing research is loneliness, Dr. J. B. Sheldon, English expert on old age, told the conference in an opening address. Dr. Sheldon is director of medicine at the Royal Hospital, Wolverhampton, England, and former president of the International Association of Gerontology.

The loneliness that saddens old people comes not only from the death and drifting away of old friends but from the feeling of being "on the shelf" and out of the active stream of family and community activity.

Occupation is the best medicine for the elderly, Dr. Sheldon said, and America needs the experience and special talents of those past middle age.

Medicine has increased the average life span and many more are now living past the conventional retirement age of 65. But so far people have generally taken for granted that those past that age are handicapped. Their talents and assets have been largely neglected.

Science News Letter, May 21, 1955

PSYCHIATRY

Mental Patients Given Electroshock-by-Proxy

► AN ELECTROSHOCK-by-proxy treatment of mental patients is now being tried in Germany, Dr. Fritz Roeder of the University of Göttingen at Göttingen, Germany, announced at a scientific meeting at St. Elizabeths Hospital, Washington.

The meeting was held as part of the 100th birthday celebration of this Government hospital, now one of the world's largest and best known institutions for the care and treatment of the mentally ill.

The new treatment reported by Dr. Roeder was developed by another German psychiatrist. It is done by giving several electroshocks to rabbits and then extracting their brains with acetone and ether. The brain extracts of the electroshocked rabbits are then injected into mental patients.

In "extremely favorable" cases of depression, the patients could be released from the hospital after several injections.

Even in serious cases, there was "an astonishing improvement" lasting two to seven days.

Patients feel tired and sleep after the injections. They all feel quieter and more "content" afterwards and are readier to reveal their feelings and discuss them with their psychiatrist. They sleep better and have better appetite, feel freer and brighter.

The effects apparently are not long lasting but further injections again bring improvement.

This proxy electroshock treatment does not help patients with schizophrenia.

Dr. Roeder himself has been treating Parkinson's disease, or shaking palsy, patients with extracts of the corpus striatum of calves' brains. He reported good results lasting four weeks, after which the injection must be repeated.

Science News Letter, May 21, 1955

ELECTRONICS

Network Color TV Is Sent From Tape

► COLOR TELEVISION recorded on magnetic tape was transmitted for the first time over commercial television network facilities as part of the dedication ceremonies of the new research center of the Minnesota Mining and Manufacturing Co. at St. Paul.

SCIENCE SERVICE's observer considered it much better than color television seen last year.

The tape-recorded telecast originated with the prototype Radio Corporation of America TV tape recorder installed for field testing at the National Broadcasting Company's studios in New York. It was transmitted over a closed circuit to St. Paul. Magnetic tape developed by 3M was used.

Some problems, involving both the machine and the tapes, remain to be solved, Dr. Harry F. Olson of the RCA laboratories said.

The system is believed to have a future as a convenient and versatile means for making electron motion pictures, particularly in business and industry and in the home, in an all-electronic chain comprising portable TV camera, TV tape recorder and standard TV receiver.

The tape recorder used for the demonstration operates at a speed of 20 feet per second and can accommodate a 15-minute TV program on a 20-inch reel using tape approximately one mil (0.001 inch) thick.

Science News Letter, May 21, 1955

MEDICINE

Fingers Put in Cold Storage for Later Use

► FINGERS AND toes can be kept in "cold storage" under the skin of the belly for possible later use to replace those lost by accident, Dr. Lyndon A. Peer of St. Barnabas Hospital, Newark, N. J., declared at the meeting of the American Association of Plastic Surgeons in Washington.

He has already performed the "cold storage" part of the operating in four New Jersey children, aged two to 10 years.

Each of the children was born with an extra finger or toe. When he removed the extra digit surgically, Dr. Peer buried it under the skin of the abdomen, or belly. All three fingers and one toe have survived and retained their characteristic structure. The fingers are still jointed and can be bent. Nail remains on the nail bed.

In past experiments of this sort, finger bones are reported to have been absorbed.

If a child or grown-up has a finger completely sliced off by accident, Dr. Peer explained, the finger cannot be successfully sewn to the stump because the burden of recreating blood circulation is too great.

But if the finger has been stored in the abdomen, it can be gradually transferred to the finger stump without ever cutting off the finger's circulation.

Science News Letter, May 21, 1955

PHYSICS

Inside The Atom

Although man has tapped the atom to make star-like explosions on earth and to power his machines, he still does not know what is the glue that cements atomic hearts.

By ANN EWING

► MAN HAS exploded atomic and hydrogen bombs, powerful nuclear reactions on earth. Although the tremendous energies inside the atom have been trapped, what binds together the contents of atomic hearts is a mystery still to be cracked.

Twenty-one particles in the nucleus are now generally recognized by physicists. Most of them exist only for fleeting bits of seconds. Some of them have strange names such as K pi-two or lambda zero. Others have long been known:

Neutrons, trigger for atomic bombs and nuclear chain reactions;

Protons, positively charged hearts of common hydrogen, and

Electrons, light-weight particles with a negative charge, whose mass movement in conductors produces electric currents.

Combined in various ways, these three basic particles once gave a very satisfactory picture of the 92 kinds of atoms then known.

Unknown Forces

Over 50 years ago, the late Prof. Albert Einstein suggested the equivalence of mass and energy. Over 15 years ago, scientists began to suspect that the energy in the mass of an atomic nucleus could be tapped. But the glue that holds the strange particles inside the nucleus is still not known, even though the blinding flash of nuclear explosions have many times spelled out the equivalence of mass and energy.

Most of the mass of the atom is in its nucleus. Each atom of an element consists of a mist of one or more electrons swirling around the nucleus, millions upon millions of times every second. Although an atom is mostly empty space, the whirling electrons form an impervious shield, keeping everything out of the space within as effectively as though they were everywhere at once.

This smoke of electrons determines the element's chemical properties, from hydrogen with one electron to mendelevium, No. 101, with 101 electrons outside its core. Atoms are so minute that about 200 million of them could be placed next to each other within an inch.

One atom, magnified three billion times, would give a globe about two feet in diameter. Yet the nucleus is so much smaller than the atom itself that, magnified the same amount, it would be barely visible.

Only particles smaller than atoms can get inside an atom. They must have great

speed to penetrate the screen thrown up by the electrons and, even then, they often go right through without hitting anything.

When these fragments of atoms do collide with the nucleus, however, sometimes they ricochet, sometimes other particles are thrown out of the nucleus. The resulting scattering, its pattern and the energies of the emerging particles, give clues to the structure of the nucleus.

But they also give one of the biggest headaches—the time lag. Such events unaccountably take about ten billion times longer than would be expected. Scientists have discovered this even though these reaction times range from a millionth to a billionth of a second or less. But why they take so long to react is not known.

Explaining not only the timing but the multitude of particles that come whizzing out of the nucleus under different circumstances are two of the puzzles physicists are trying to solve today. So far each step forward in probing the nucleus has led to more questions than it answers.

And if and when scientists do understand what holds an atom together, the information may or may not be "useful."

Until 1932 a nucleus was thought to be the indivisible atomic heart, made of protons, neutrons and electrons bound together in some unexplained manner.

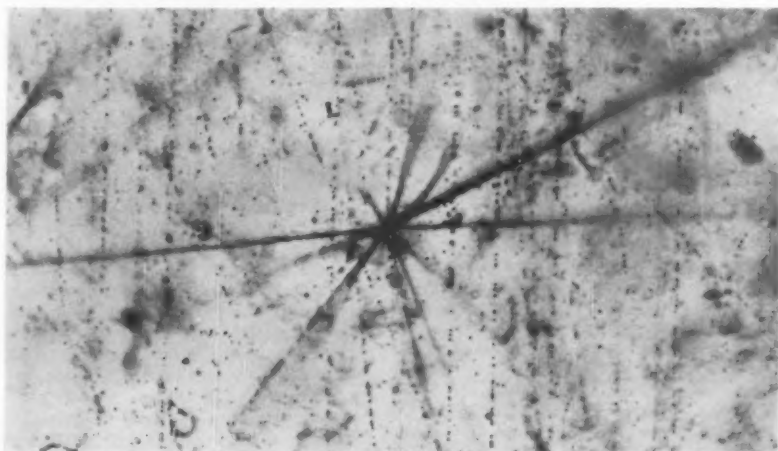
Now physicists wonder whether an "onion" or a "water drop" is a more accurate picture of an atomic heart. For when the core has only a small number of particles, as in oxygen, it reacts to bombarding particles, as if it consisted of easily peeled layers. But when the nucleus has many particles crowded together, as in radium, the picture is more like that of a vibrating water drop which, after swallowing several bombarding particles, suddenly splits into two.

Or, as one scientist explained, the nucleus seems to have a schizoid personality. At low energies, its inhabitants all seem to follow one set of rules, but at high energies, they behave very differently.

Physicists have found a bewildering number of particles can be driven out of the nucleus by other particles, slow ones or fast ones, even by the energy of light itself. From this crowd, some familiar faces are emerging. The particles seem to fall into certain groups having somewhat similar properties.

Of these, the first to be discovered were the light-weight mesons. Mesons are unstable particles, lasting only a few millionths of a second, with a mass between that of the electron and proton. Five examples of this type are now known: three pi mesons, seen with positive, negative and neutral charge, and two mu mesons, one positively and one negatively charged.

A group of heavier mesons, also with masses between that of electrons and protons, are known as K mesons. These include theta zero, K mu-two and Ke, two



STRANGE NUCLEAR REACTIONS—A photographic emulsion exposed to billion-volt protons from the cosmotron at Brookhaven National Laboratory, Upton, N. Y., shows the strange nuclear reactions from which physicists are learning about the nucleus. A high-energy proton, disintegrating an atom in the emulsion from which at least ten particles flew out, caused the "star."

tau particles, one with a positive and one with a negative charge, and K pi-two, either positively or negatively charged.

The third set consists of those with higher masses than protons. Called hyperons, they are lambda zero, negative xi, and two sigma's, positively and negatively charged.

Completing the list of 21 accepted particles besides the electron, proton and neutron are the positron, a positively charged electron, and the neutrino, a tiny particle having little or no mass and no electric charge. The neutrino has never been seen, but its existence, nevertheless, is believed real. A neutrino might well penetrate the entire mass of the sun without reacting.

To analyze atomic hearts and learn about the strange particles that come zooming out of them, scientists use many tools to measure lifetimes, energies and masses.

One of the most promising recently developed devices is called a bubble chamber.

Subatomic particles plunging through a superheated solution, kept under high pressure to delay its boiling, produce a train of bubbles. In this manner the bubble chamber is similar in operation to the cloud chamber, which physicists have been using for many years to track the otherwise invisible particles. A cloud chamber is filled with supersaturated water vapor in which the particles cause fog trails to form.

Great advantage of the bubble chamber is that about 20 times as many particles can be caught in it as in a conventional cloud chamber of the same size. Different liquids, such as liquid hydrogen, can also be used.

Another important, recent development is the polarized proton beam. In it, the protons have spins all in the same direction. The achievement is equivalent to the polarization of light, in which the light's vibrations are all in one direction, rather than randomly distributed.

• RADIO

Saturday, May 28, 1955, 5:00-5:15 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Gordon H. Strom, professor of aeronautical engineering, New York University, will discuss "Air Pollution."

Every atomic nucleus, as well as individual particles, spins on its axis. In an unpolarized proton beam, the axes point every which way. To polarize the beam, protons are hurled at a target of hydrogen, beryllium or carbon. By choosing only those protons that ricochet at a rather small angle, the particles with axes pointed in the same direction are selected.

The protons lose energy when they smash into the target, but if they have high enough energies, the bombardment and selection process can be repeated to get a purer polarized beam. So far scientists have managed to analyze the particles produced after a beam has gone through three targets, known to the scientists as triple scattering. They have also learned to tell whether the axis is pointed "up" or "down."

Although man is reaching higher and higher energies in atom smashers such as needed to polarize protons, even the most powerful machines are only now beginning to rival the low end of the cosmic rays that bombard the earth from outer space.

Photographs of nuclear collisions in cloud chambers located high in the mountains or installed in balloons and airplanes catch tracks of some of these. Emulsions such as used in ordinary photographic film are also a valuable tool for spying on cosmic rays and particles resulting from accelerator smash-ups.

GENERAL SCIENCE

Science Prexies Over 50

► IF YOU have aspirations of becoming president of a professional society, you'll most likely have to wait until your fifties to be elected.

This is the conclusion of Dr. Harvey C. Lehman, professor of psychology at Ohio University, who has compiled the chronological ages at which individuals have first been elected presidents of 68 well-known national learned, scientific and technical societies.

Although professional prestige may be attained at any age level from the twenties to the late eighties, Dr. Lehman discovered, "the fifties are predominantly the years during which both men and women are most likely to become presidents of their professional organizations."

In his study, Dr. Lehman found that although the names of the former presidents of women's societies could be obtained, "the attempt to find their birth dates was not particularly successful." He reported that "a disconcerting number of women who have achieved contemporary eminence and whose names appear in biographical directories have failed to give their birth dates."

Dr. Lehman also found that:

1. There is no correlation between sizes of memberships and the average ages of the presidents.

2. Youthful presidents are elected more often by professional groups that include a large proportion of research workers rather than those whose members are chiefly practitioners.

3. There is a tendency for older professional societies to elect older presidents, and newly-founded groups, relatively youthful presidents.

4. That the average ages of society presidents are influenced by method of election, the society's membership policy and factors

influencing the cost to the president in time and money.

The Ohio psychologist's findings led him to conclude that although presidents of such groups "are a very able and fine group of men, it nevertheless seems clear that sheer professional merit, in the narrow sense of the term, is not the sole factor that determines whether or not an individual is destined to become the president of his professional group." Dr. Lehman reported his study to *Scientific Monthly*, journal of the American Association for the Advancement of Science.

Science News Letter, May 21, 1955

Science News Letter, May 21, 1955

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ALL THE SEXES: A Study of Masculinity and Femininity—George W. Henry with foreword by David E. Roberts—*Rinehart*, 599 p., \$7.50. Each individual, the author states, is an in-calcuable complex of masculinity and femininity. The title is intended to convey the idea of gradation from masculinity to femininity rather than any rigid division into two sexes.

THE ADVANCED PART OF A TREATISE ON THE DYNAMICS OF A SYSTEM OF RIGID BODIES: Being Part II of a Treatise on the Whole Subject With Numerous Examples—Edward John Routh—*Dover*, 6th ed., 484 p., paper \$1.95, cloth \$3.95. Re-issue of a famous work first published in 1860.

THE AIRCRAFT YEARBOOK 1954: Official Publication of the Aircraft Industries Association of America—Fred Hamlin, Eleanor Thayer and Lynn Black, Eds.—*Lincoln Press*, 472 p., illus., \$6.00. Complete directory of aircraft, executives and agencies in the U. S. with a review of outstanding aviation events of the year.

ALMOST PERIODIC FUNCTIONS—A. S. Besicovitch—*Dover*, 180 p., paper \$1.75, cloth \$3.50. Student's edition of an important mathematical work.

APPLIED SOLAR ENERGY RESEARCH: A Directory of World Activity and Bibliography of Significant Literature—E. J. Burda, Ed.—*Stanford Research Institute for Association for Applied Solar Energy*, 298 p., paper \$4.00, cloth \$5.00. Listing name and address of research groups, names of principal researchers and description of research program. Covers 27 countries.

BIRD RECOGNITION: III. Rails, Game-Birds and Larger Perching and Singing Birds—James Fisher—*Penguin*, 158 p., illus., paper, 85 cents. To help bird watchers to know the birds they are likely to see in the British Isles.

THE BIRTH AND DEVELOPMENT OF THE GEOLOGICAL SCIENCES—Frank Dawson Adams—*Dover*, 506 p., illus., paper \$1.95, cloth \$3.95. An unabridged republication of this work published in 1938 which draws on the works of 500 early writers including Aristotle and Humboldt.



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BORDERLAND OF THE UNKNOWN: The Life Story of Gilbert Newton Lewis, One of the World's Great Scientists—Arthur Lachman—*Pageant Press*, 184 p., \$3.00. Biography of the man who first isolated heavy water.

CANADIAN CANCER CONFERENCE: Vol. I, Proceedings of the First Canadian Cancer Research Conference, Honey Harbour, Ontario, June 16-19, 1954—R. W. Beggs, Ed.—*Academic*, 443 p., illus., \$8.80. Because researchers in this field in Canada are widely separated, it was deemed wise to bring them together for this national conference.

THE CHEMICAL INDUSTRY FACTS BOOK—Manufacturing Chemists' Association, 2d ed., 148 p., illus., paper, \$1.00. Chemistry has emerged during the first half of this century as a major industry.

THE CHEMISTRY OF PETROLEUM HYDROCARBONS—Benjamin T. Brooks and others, Eds.—*Reinhold*, Volume II, 448 p., illus., \$13.50, Volume III, 690 p., illus., \$18.00. A reference work for petroleum engineers and organic chemists.

THE CHEMISTRY OF SYNTHETIC DYES AND PIGMENTS—H. A. Lubs—*Reinhold*, American Chemical Society Monograph Series, 734 p., \$18.50. An authoritative reference work covering developments since the discovery of mauve, the first man-made dye.

COMMUTING PATTERNS OF INDUSTRIAL WORKERS: A Study of Experience Since 1940 in the Northeast Region—Leonard P. Adams and Thomas W. Mackesey—*Cornell University Housing Research Center*, Research Publication No. 1, 135 p., illus., paper, \$2.00. Evidence indicates that workers now live farther from their work than they used to.

CONGENITAL MALFORMATIONS AND BIRTH INJURIES: A Handbook on Nursing—Jessie Stevenson West—*Association for the Aid of Crippled Children*, 178 p., illus., paper, \$1.00. Because more infants are born alive than ever before, more babies with congenital malformations are living who previously would have died. This provides a new challenge to nurses.

THE CONTINUUM AND OTHER TYPES OF SERIAL ORDER: With an Introduction to Cantor's Transfinite Numbers—Edward V. Huntington—*Dover*, 2d ed., 82 p., paper \$1.00, cloth \$2.75. Student's edition.

DELINQUENT BOYS: The Culture of the Gang—Albert K. Cohen—*Free Press*, 202 p., \$3.50. Delinquency is seen by the author as a sub-culture which continues to exist because it provides its child members with the prestige of status that otherwise they would lack.

DUST IS DANGEROUS—C. N. Davies with a foreword by Sir George Barnett—*Faber and Faber (John de Graff)*, 116 p., illus., \$4.50. A research scientist writes on a serious industrial problem.

THE DYNAMICAL THEORY OF GASES—Sir James H. Jeans—*Dover*, 4th ed., 444 p., paper \$2.00, cloth \$3.95. Republication in an inexpensive student's edition of a well-known work.

FEEDING YOUR CHILD—Samuel M. Wishik with foreword by Leona Baumgartner—*Double-day*, 223 p., illus., \$3.50. A practical guide that answers the everyday questions related to feeding from infancy through the school years.

FRONTIER TO SPACE—Eric Burgess with a

foreword by the Astronomer Royal, Sir Harold Spencer Jones—*Macmillan*, 174 p., illus., \$4.50. Telling how modern rockets are being used to obtain for us information about the upper atmosphere.

FUNDAMENTALS OF PLANT SCIENCE: A Laboratory Manual—G. W. Prescott and J. C. Elliott—*Burgess*, 271 p., illus., paper, \$4.00. Intended for a year's course in general botany.

HOUSEHOLD PHYSICS: A Textbook for College Students in Home Economics—Madalyn Avery—*Macmillan*, 3d ed., 472 p., illus., \$5.50.

INDIAN VILLAGE—S. C. Dube with foreword by Morris Edward Opler—*Cornell University Press*, 248 p., illus., \$3.00. From 70% to 80% of India's population live in such villages as the one described in this book by an Indian social anthropologist.

THE LONELY SKY—William Bridgeman and Jacqueline Hazard—*Holt*, 316 p., illus., \$3.95. The autobiography of a test pilot and the experimental planes he has flown, particularly the needle-nosed Skyrocket.

MOTO-KINESTHETIC SPEECH TRAINING—Edna Hill Young and Sara Stinchfield Hawk—*Stanford University Press*, 176 p., illus., \$5.00. Describing a method of speech correction developed by the senior author to correct a defect in her own speech.

THE NATIONAL RESEARCH COUNCIL REVIEW 1954—C. D. Howe, Chairman—*National Research Council (Canada)*, 262 p., illus., paper, 75 cents. Reporting research conducted during the year and containing a directory of scientific personnel.

OUR WONDERFUL EYES—John Perry with foreword by George Wald—*Whitely House*, 158 p., illus., \$2.75. A simple description of how we see, with many experiments you can perform without expensive equipment.

PET HAMSTERS—All-Pets Books, 28 p., illus., paper, 35 cents. How to select and care for a popular pet.

PICTORIAL AMERICANA: A Select List of Photographic Negatives in the Prints and Photographs Division of the Library of Congress—Charles G. LaHood Jr., Ed.—*Library of Congress*, 2d ed., 68 p., paper, 25 cents. Covering various phases of American life and history. Photoprints listed can be obtained at from 25 cents up.

PICTURE BOOK OF TV TROUBLES: Vol. 3, Video I-F & Video Amplifier Circuits—John F. Rider Laboratories Staff—*Rider*, 90 p., illus., paper, \$1.80. How to tell what is wrong inside the set from the image appearing on the picture tube.

PLASTICS TOOLING—Malcolm W. Riley—*Reinhold*, 123 p., illus., \$2.50. A status report on an infant production method.

POMP AND PESTILENCE: Infectious Disease, Its Origins and Conquest—Ronald Hare—*Philosophical Library*, 224 p., \$5.75. Considering the infections that must have plagued prehistoric man and affected his evolution, and looking forward to what may be the fate of man's diseases in the future.

THE PROTECTION OF STRUCTURAL STEEL: Current Good Painting Practice for Steel Structures in the United States—Joseph Bigos—*Mellon Institute*, 8 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

PSYCHOTHERAPEUTIC INTERVENTION IN SCHIZOPHRENIA—Lewis B. Hill—*University of Chicago Press*, 216 p., \$5.00. Addressed to young psychiatrists.

RELIGIOUS FACTORS IN MENTAL ILLNESS—Wayne E. Oates—*Association Press*, 239 p., \$3.50. Intended to aid the pastor and psychiatrist in understanding each other and helping the mental patient.

SELECTIVE CHECKLIST OF PRINTS AND PHOTOGRAPHS: Recently Cataloged and Made Available for Reference, Lots 4121-4801—*Library of Congress*, 87 p., paper, 70 cents.

SHOULD THE PATIENT KNOW THE TRUTH! A Response of Physicians, Nurses, Clergymen, and Lawyers—Samuel Standard and Helmuth Nathan, Eds.—*Springer Publishing Co.*, 160 p., paper \$2.00, cloth \$3.00. Experts discuss a question which must be faced sooner or later in most families.

SOIL AND WATER CONSERVATION ENGINEERING—Richard K. Frevert, Glenn O. Schwab, Talcott W. Edminster and Kenneth K. Barnes—*Wiley*, 479 p., illus., \$8.00. A professional text for agricultural engineering students.

STEEL MILL AND COKE BY-PRODUCTS WASTES—W. W. Hodge—*Mellon Institute*, 18 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

SYMPOSIUM ON COAL SAMPLING—W. M. Bert-hoff and others—*American Society for Testing Materials*, ASTM Special Technical Publication No. 162, 152 p., illus., paper, \$2.75. Reporting experiments designed to collect data on this problem.

TV FIELD SERVICE MANUAL WITH TUBE LOCATIONS: Vol. 4—Harold Alsberg, Ed.—*Rider*, 151 p., illus., paper, \$2.40. To help the technician locate trouble without the delay of taking the television receiver away to the shop.

TIME TO TALK ABOUT INDIA—Arthur Goodfriend—*Foreign Policy Association*, 12 p., illus., paper, 50 cents. Information basic to an understanding of a complex world problem.

TWO YEARS IN THE ANTARCTIC—E. W. Kevin Walton—*Philosophical Library*, 194 p., illus., \$4.75. A personal account of a man who was a member of a British survey party.

VITAMINS IN THEORY AND PRACTICE—Leslie J. Harris—*Cambridge University Press*, 4th ed., 366 p., illus., \$6.50. The highlights of the science of "vitamins" as presented in a series of Thursday afternoon lectures at the Royal Institution, London.

WORLD POPULATION AND WORLD FOOD SUPPLIES—Sir E. John Russell—*Allen & Unwin (Macmillan)*, 513 p., illus., \$8.50. In the past the world has been saved from threatened starvation by new scientific advances, particularly the development of a new science of plant

genetics; now it depends upon close cooperation between the more advanced and less advanced countries together with a sound population policy.

Science News Letter, May 21, 1955

MEDICINE

Doctors Smoking Less But Expense Is Reason

► THE NUMBER of doctors who smoke cigarettes is gradually decreasing, but increasing cost, not the risk of lung cancer, seems to be the reason.

These are the conclusions of a short questionnaire study of 211 doctors working in the hospitals in Oxford, England, as reported by Dr. D. A. Pyke of the Radcliffe Infirmary, Oxford, to the *British Medical Journal* (May 7).

Less than half of this small group of doctors smoke, a smaller proportion than in the general population, Dr. Pyke found.

Of the 211, the number who smoked cigarettes eight years ago was 129. Now it is 100. The number giving up smoking since an association with lung cancer was discovered has not increased.

The proportion of those who accept the evidence of an association between cigarette smoking and lung cancer is so much higher among the non-smokers than the smokers that Dr. Pyke suspects the smokers of prejudice in favor of tobacco because of the pleasure of cigarette smoking.

Science News Letter, May 21, 1955

PUBLIC SAFETY

Cringe When You See Rear-End Crash Coming

► IF YOU hear screeching brakes behind you and see in your rear-view mirror that another car is about to crash into yours, hunch your shoulders and cringe down. It will help reduce injuries.

This is suggested in studies by the Institute of Transportation and Traffic Engineering at the University of California at Los Angeles.

A series of rear-end collisions, involving both humans and dummies was staged at speeds ranging from seven to 20 miles per hour. It was found that at impact speeds near 10 miles per hour a sudden force of as much as 150 pounds was exerted on the head of the front car occupant, causing a "whiplash" effect.

At 20 miles per hour the front-seat back flexed rearward considerably so that the application of force on the neck was not as abrupt. The collapse of the car's rear at this speed absorbed much of the shock.

Participants in the test found that after initial runs they tended to cringe involuntarily as the cars crushed together. This hunching of shoulders reduced the head whip effect considerably.

The studies were conducted by Derwyn Severy and J. H. Mathewson of U.C.L.A. and Dr. Charles Bechtol of Yale Medical College.

Science News Letter, May 21, 1955

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► CLOTHING THE slopes of the lower mountains of the East and running down into the lowlands, wherever the soil is stony and poor enough to suit its hardy tastes, we find the mountain laurel.

It is one of the most glorious of our shrubs, ranking along with rhododendron and azalea, and indeed is a close cousin of theirs. Like them, it is one of those peculiar plants that thrive well only in acid soils, and one should know the chemical condition of one's yard, or else have it artificially adjusted to suit, before planting laurel.

The botanical name of the mountain laurel constitutes one of the most enviable of all monuments ever erected by one man in honor of another. When a botanist wants to pay high compliment to a friend,

he names a plant after him. Naturally, the more beautiful the flower, the higher the compliment.

Peter Kalm, contemporary and co-worker of the great Swedish naturalist Linnaeus, who first organized botany on a modern basis, has received perhaps the most flowery botanical compliment that has ever fallen to the lot of a scholarly collector of plants. For when Linnaeus was called on to give a name to this new handsome shrub from America, he thought of his friend and former pupil Peter Kalm, who had traveled in the New World, and called the beautiful flower *Kalmia*.

Kalmia, or mountain laurel, is a most attractive plant at any time, for its dark shining leaves are evergreen, relieving even the white bareness of the winter woods. But when spring brings its leaves to bloom, the laurel simply outdoes itself. Its clusters of closed star-flowers, pink, but by sheer miracle of vegetative good taste not too pink, are things for poets to write sonnets about.

Most of our fine flowers are in greatest danger from vandalistic gatherers when they are in bloom, which is what one might expect. But the mountain laurel is less troubled than it is in late autumn and early winter. Its evergreen leaves have found altogether too good a market in eastern cities, and the more accessible areas where it grows are rapidly being depleted by the market-hunters.

Fortunately for future generations of American flower-lovers, mountain laurel is true to its name, and the higher slopes of the Appalachians still give it refuge, keeping green the memory of Linnaeus' friend, Peter Kalm.

Science News Letter, May 21, 1955

Questions

ELECTRONICS—How large are the "whiskers" that grow on tin? p. 326.

☐ ☐ ☐

GEOPHYSICS—When did the Wisconsin glaciation begin? p. 327.

☐ ☐ ☐

METALLURGY—Why is ordinary aluminum unsatisfactory in some uses for supersonic planes? p. 325.

☐ ☐ ☐

PSYCHOLOGY—How is stress used to combat schizophrenia? p. 322.

☐ ☐ ☐

PUBLIC HEALTH—What are the gases in smog that form oxidants in sunlight? p. 328.

☐ ☐ ☐

Photographs: Cover, Stanford Research Institute; p. 323, McDonnell Aircraft Corporation; p. 325, Clifford Matteson; p. 326, Army Medical Service Graduate School; p. 330, Brookhaven National Laboratory; p. 336, Bakelite Company.

form, through the use of hormones and chemicals. Continued intensive research holds out tangible hope for the future."

Science News Letter, May 21, 1955

PSYCHOLOGY

Homosexuals May Not Be Security Risks

► THE IDEA that homosexuals are necessarily bad security risks is debunked in a report by a psychiatrist before the American Psychiatric Association in Atlantic City.

"There is little proof," he said, "that the official government attitude that homosexuals make poor security risks is valid."

The psychiatrist is Dr. Manfred S. Guttmacher, chief medical officer at the court house in Baltimore, Md.

There is no general agreement, he finds, as to the cause of homosexuality, its prevention, methods of treatment and success with such methods, nor as to the social significance of homosexual behavior.

Science News Letter, May 21, 1955

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MEDICINE

Leukemia Death Rate Shows Slight Decline

► A "SLIGHT" decline in the death rate from leukemia since 1951 is reported by statisticians of the Metropolitan Life Insurance Company. The report covers the company's industrial policyholders, most of whom live in cities and towns.

The decline follows a rising death rate over many years, from 1.8 per 100,000 in insured persons in 1930 to 4.7 per 100,000 in 1951.

The statisticians point out that it is difficult to say whether the mortality has reached the level at which it may become stabilized, or whether it will continue upward after a temporary interruption, as has happened in the past.

Even past mortality trends for leukemia are not as unfavorable as would appear at first glance.

"A large part of the long-term increase in the death rate undoubtedly reflects merely the more frequent detection of the condition through improved methods of diagnosis," the statisticians comment. "Also, some progress has been made in the treatment of the disease, particularly the acute

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Science News Letter, May 21, 1955

✿ **FLY-KILLER DEVICE** has "landing platforms" that rise out of a dispenser of a lethal chemical solution that lures and kills flies, but is harmless to humans. Looking like a flower-pot, water is added to the solution bottle, then emptied into the dispenser and the pylon raised.

Science News Letter, May 21, 1955

✿ **CATTLE SYRINGES** for dosing animals with antibiotics or sulfa drugs are molded of a polyethylene plastic. Loaded and ready for use, the lightweight, unbreakable syringes have a shelf life of 18 months.

Science News Letter, May 21, 1955

✿ **SEE-THROUGH SCALEMASTERS** for architects and engineers eliminate need to twist rule to find a scale. One is a flat transparent architect's rule with 14 scales and the other is a flat transparent engineer's rule with nine full divided scales.

Science News Letter, May 21, 1955



✿ **INFLATABLE CRIB** allows a young baby to nap wherever and whenever he needs to. Made of a soft plastic, the puff-up crib, shown in the photograph, fits into a large handbag. When mother inflates it, the crib sides stand eight inches high and it measures 35 by 20 inches. Easy to clean, the plastic floor protects beds, sofas or car seats.

Science News Letter, May 21, 1955

✿ **ERASABLE INDIA ink** erases with a regular pencil eraser. Made so that it can also be fixed for permanence when desired, the jet-black draftsman's ink is waterproof and free-flowing like conventional india inks.

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✿ **TRAFFIC GAME** for the tricycle set provides improved, scaled down authentic equipment to help children develop safe traffic habits. Game includes five metalized, full-color replicas of regulation traffic signs, a manually-operated red and green light, a police license plate and badge, whistle, traffic tickets and a set of playing rules.

Science News Letter, May 21, 1955

✿ **CLEANING AID** for housewives is a roll of 18 inches of viscous sponge on a ten-inch handle that enables cleaning under refrigerators, behind stoves and other hard-to-get-at places. Available in four colors, it is easily cleaned.

Science News Letter, May 21, 1955

Do You Know?

The human skeleton is not particularly well adapted for upright posture which makes man prone to backaches and other ills which might not occur if he ran on all fours.

Lettuce plants came to this country with the early colonists; its history goes back to a loose, leafy, stemmed plant of the Near East or Western Asia and it was reported in China as early as the 5th century A.D.

About 350 plant diseases do extensive damage to farm crops each year and approximately 700 insect pests ravage America's farmlands.

The wandering albatross and the royal albatross probably have the largest wing spread of flying birds, reaching 11 and a half feet.

Although about 500,000,000 tons of bituminous coal have been mined annually since 1910, coal still in the ground in the United States amounts to about 95% of the original total reserves.

Most birds move their wings in unison, but the swift, a champion speedster, beats its wings alternately.

In the past 20 years, deaths from lung cancer in women have increased over 200% and in men over 600%.

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